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# CLINICAL PROFILE AND FUNCTIONAL ASSESSMENT OF CHILDREN WITH JUVENILE IDIOPATHIC ARTHRITIS IN A TERTIARY CARE CENTER- A DESCRIPTIVE CROSS SECTIONAL STUDY

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**Abstract**

**Background:** Juvenile idiopathic arthritis is the commonest pediatric onset rheumatologic disease. JIA is a heterogeneous group of arthritis of unknown etiology, which presents in children less than 16 years of age. JIA classification by ILAR includes 7 categories with varying clinical presentations. None of the available drugs are curative however recently with the introduction of non-biological and biological disease modifying anti-rheumatic drugs, the outcomes of JIA has improved drastically. **Methods:** A descriptive cross sectional study was conducted at the Institute of Child health among children less than 12 years presenting with JIA. Their clinical profile and functional improvement following drug therapy was assessed. **Results:** 54 children were included in the study. Commonest type of arthritis our study was systemic onset. Most common affected age group is 9-11 yrs. Males outnumber female. Fever and joint pain were the predominant symptoms. Uveitis is was not seen an any of oligo-articular type.. Knee and wrist were the most commonly involved joints. ESR, CRP and leukocytosis had significant correlation with disease activity. Rheumatoid factor was seen in 18.5 %. Methotrexate and steroids were effective drugs in controlling disease process and activity.

**Keywords:** Juvenile İdiopathic Arthritis, DMARDS, Steroids, ILAR.

## INTRODUCTION

Juvenile rheumatoid arthritis (JRA) is the most common arthritis of childhood. It represents a group of disorders that share the clinical manifestation of chronic joint inflammation. The etiology is unknown, and the genetic component is complex, making clear distinctions between the various subtype is also difficult. As a result, the various sets of classification criteria that have been recognized have different benefits and limitations.

A new nomenclature, Juvenile Idiopathic Arthritis (JIA), is being increasingly used in order to define the subgroups better. JIA is an autoimmune, non-infective, inflammatory joint disease of more than 6 weeks duration in children less than 16 years of age. The disease commonly occurs in children from the ages of 7 to 12, but it may occur in adolescents as old as 15 years of age, as well as in infants.1 In the United States approximately 300000 children are estimated to have some type of arthritis.

The incidence of JIA ranges from 4-14 cases per 100000 children annually.2 The cardinal clinical feature is persistent swelling of the affected joint(s), which commonly include the knee, ankle, wrist and small joints of the hands and feet. Swelling may be difficult to detect clinically, especially for joints such as those of the spine, sacroiliac joints, shoulder, hip and jaw, where imaging techniques such as ultrasound or

magnetic resonance imaging (MRI) are very useful. The 3 major types of JIA are: oligoarticular JIA, polyarticular JIA and systemic JIA.3,4

## METHODOLOGY

**Study design: A** Descriptive Study Cross sectional study

**Study place:** Rheumatology OP and general ward, Saveetha medical college and hospital Chennai

**Study population**: Children < 12 years with juvenile idiopathic Arthritis

**Duration of the study:** 1 year

**Inclusion criteria:** Children with Juvenile rheumatoid arthritis based on ILAR criteria.

**Exclusion criteria: Children** with chronic systemic illness with JIA

**Methodology:**

All children under inclusion criteria are recruited from OP and ward. They are grouped into types based on ILAR Criteria. The clinical profile was studies and recorded as per the Performa.

**Statistical analysis:**

Data was entered in Microsoft excel sheet and Analyzed using SPSS version 28 for windows , Epi info , and chi square and p Values were obtained

## RESULTS

Total no. of patients was 54. Out of which 8 (14.8%) were of oligo-articular type, 16 (29.6%) were polyarticular type and 30 (55.6%) were systemic onset. Out of 54 children, 30 (55.6%) were of <8 yrs. and 24 (44.4%) were of age > 8 yrs. and the mean age was 7.83 yrs. Out of 54 children, 28 (51.9%) were males and 26 (48%) were females. Out of 54 children, 30 (55.6%) had disease onset less than 5 yrs. duration whereas 24 (44.4%) had onset more than 5ys

**Table 1: Demographic characteristic**

| Parameter | N(%) |
|---|---|
| **Type of arthritis** | |
| Oligo arthritis | 8(14.8%) |
| Poly arthritis | 16(29.6%) |
| Systemic onset | 30(55.6%) |
| **Age** | |
| <8 years | 30 (55.6%) |
| >8 years | 24(44.4%) |
| **Gender** | |
| Male | 28(51.9%) |
| Female | 26(48.1%) |
| **Duration of arthritis** | |
| <5 years | 30 (55.6%) |
| >5 years | 24(44.4%) |

**Table 2: Clinical presentation**

| Symptoms | No. | % |
|---|---|---|
| Fever | 46 | 85.2 |
| Rash | 11 | 20.4 |
| Hepatomegaly | 20 | 37 |
| Joint pain | 54 | 100 |
| Joint swelling | 17 | 31.5 |
| Lymphadenopathy | 16 | 29 |
| Pericarditis | 0 | 0 |
| Uveitis | 0 | 0 |

Among clinical features, fever was present in 46 (85.2%) children, 11 (20.4%) had rashes, 20(37%) had hepatomegaly, joint pain and swelling was present in 54(100%) and 17 (31.5%) children respectively, 16 of them had lymphadenopathy. None had involvement of heart and eyes. Almost every joint was involved in study population. Knee is the commonest joint involved. 40 cases (74.6%) had wrist involvement. Ankle involvement was found in 38 (70.4%) cases.23 (42.6%) children had involvement of elbow. There was evidence of small joint involvement, metacarpophalangeal -28 (51.9%), proximal interphalangeal -16(29.6%), metatarsophalangeal-12(22.2%) children. Hip, shoulder and cervical joint involvement were also seen in few cases

**Table 3: Joint involvement**

| Joint involvement | No. | % |
|---|---|---|
| Cervical | 4 | 7.4 |
| Shoulder | 3 | 5.6 |
| Elbow | 23 | 42.6 |
| Wrist | 40 | 74.6 |
| Metacarpal-phalangeal | 28 | 51.9 |
| Proximal interphalangeal | 16 | 29.6 |
| Hip | 1 | 1.9 |
| Knee | 48 | 88.9 |
| Ankle | 38 | 70.4 |
| Metatarsophalangeal | 12 | 22.2 |

**Table 4: Symmetry of joint involvement**

| Articular presentation | No. | % |
|---|---|---|
| Symmetrical | 33 | 61.1 |
| Asymmetrical | 21 | 38.8 |

33 (61.1%) out of 54 children had symmetrical joint involvement and the remaining 21(38.8%) had asymmetrical involvement of joints. Out of 54 children, 50% had leucocytosis, anemia was present in nearly 50% of cases. ESR was elevated in 42 (77%) cases. Rheumatoid factor was positive in 10 cases. CRP was positive in two-thirds of cases and ASO was positive in 12 (22%) children.

**Table 5: Hematological parameters**

| Hematological parameters | No. | % |
|---|---|---|
| Total count > 11000 | 27 | 50 |
| Anemia <10g/dl | 25 | 46.3 |
| ESR >20mm in 1$^{st}$ hour | 42 | 77.8 |
| Rheumatoid factor +ve | 10 | 18.5 |
| ASO +ve | 12 | 22.2 |
| CRP+ ve | 32 | 59.3 |

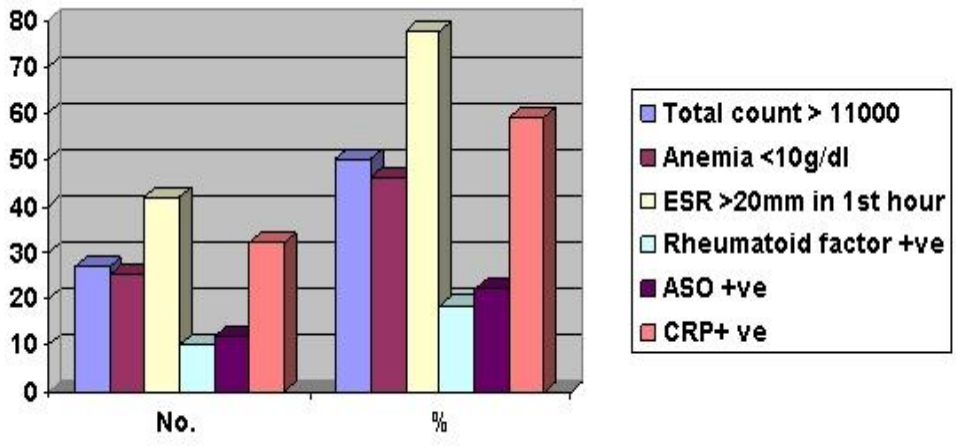


**Table 6: Drug therapy**

| Treatment | No. | % |
|---|---|---|
| NSAIDS | 54 | 100 |
| Prednisolone | 34 | 63 |
| Methotrexate | 46 | 85.2 |

Out of 30 cases who were < 8 yrs, 3 were of oligo articular, 7 polyarticular, 20 systemic onset. Among those who were > 8 yrs, 5 were oligo articular, 9 polyarticular, 10 systemic onset. There was no statistical significance. Among 28 males, 6 were oligoarticular, 9 polyarticular, 13 systemic onset. Among 26 females, 2 were oligo articular, 7 polyarticular, 17 systemic onset. There was no statistical significance.

Children with early onset, 3 were oligo articular, 8 polyarticular, 19 systemic onset. Those with late onset, 5 were oligo articular , 8 polyarticular, 11 systemic onset type. There was no statistical significance.

Fever was present in 5 cases of oligoarticular, 12 cases of polyarticular, 29 cases of systemic onset. P value was 0.021 which is significant Rash was not a feature in oligoarticular type. It was seen in 1 case of polyarticular, 10 cases of systemic type. p value was 0.028 which was statistically significant.

Hepatomegaly was seen in 2 cases of polyarticular, 18 cases of systemic type. It was not present in oligo articular type. P value was 0.00 which is statistically significant.

Joint pain was seen in 16 cases of polyarticular , 30 cases of systemic onset 8 cases of oligoarticular. Joint swelling was present in 8 cases of polyarticular, 9 cases of systemic onset. P value was 0.044 which is statistically significant. Lymphadenopathy was present 2 cases of polyarticular and 13 cases of systemic onset type. It was not seen in oligoarticular type. P value was 0.01 which is statistically significant Shoulder joint was involved in 1 case of polyarticular, 2 cases of systemic with no statistical significance.

Elbow was involved in 2 cases of oligoarticular, 8 cases of polyarticular, 13 cases of systemic type with no statistical significance. Wrist is involved in 3 cases of oligoarticular,13 cases of polyarticular, 24 cases of systemic onset with significant p value of 0.038.Metacarpophalangeal joint was involved in 10 cases of polyarticular, 17 cases of systemic type. P value was significant 0.01.Proximal interphalangeal joint was involved in 4 cases of polyarticular, 12 cases of systemic type with no statistical

significance.Hip was involved in only 1 case of systemic type. Knee was involved in 8 cases of oligoarticular, 13 cases of polyarticular, 27 cases of systemic type with no statistical significance. Ankle was involved in4 cases of oligoartiarticular, 13 cases of polyarticular, 21 case of systemic type with no statistical significance Metatarsophalangeal joint was involved in 8 cases of polyarticular, 4 cases of systemic type. P value was significant 0.005

**Profile of arthritis:**

**Table 9: Profile of arthritis**

| | Oligoarticular | Polyarticular | Systemic onset | P value |
|---|---|---|---|---|
| **Age** | | | | |
| < 8 yrs | 3 | 7 | 20 | o.177 |
| >8 yrs | 5 | 9 | 10 | |
| **Sex** | | | | |
| Male | 6 | 9 | 13 | 0.258 |
| Female | 2 | 7 | 17 | |
| **Disease onset** | | | | |
| <5yrs | 3 | 8 | 19 | 0.369 |
| >5yrs | 5 | 8 | 11 | |
| **Clinical presentation** | | | | |
| Fever | 5 | 12 | 29 | **0.021 S** |
| Rash | 0 | 1 | 10 | **0.028 S** |
| Hepatomegaly | 0 | 2 | 18 | **0.000 S** |
| Joint pain | 8 | 16 | 30 | **0.044 S** |
| Joint swelling | 0 | 8 | 9 | **0.01 S** |
| Lymphadenopathy | 0 | 2 | 13 | |
| **Joint involvent** | | | | |
| Shoulder | 0 | 1 | 2 | 0.757 |
| Elbow | 2 | 8 | 13 | 0.502 |
| Wrist | 3 | 13 | 24 | **0.038 S** |
| Metacarpophalangeal | 0 | 10 | 17 | **0.01 S** |
| Prox interphalangeal | 0 | 4 | 12 | 0.079 |
| Hip | 0 | 0 | 1 | 0.665 |
| Knee | 8 | 13 | 27 | 0.371 |
| ankle | 4 | 13 | 21 | 0.286 |
| metatarsophalangeal | 0 | 8 | 4 | **0.005 S** |
| **Hematological parameter**Leucocytosis | 0 | 6 | 16 | **0.02 S** |
| Anemia | 3 | 7 | 15 | 0.796 |
| ESR | 2 | 11 | 24 | **0.01 S** |
| Rheumatoid factor + ve | 0 | 5 | 5 | 0.165 |
| ASO + ve | 2 | 3 | 7 | 0.919 |
| CRP + ve | 4 | 6 | 22 | 0.053 |
| **Treatment** | | | | - |
| NSAIDS | 8 | 16 | 30 | .031 S |
| Prednisolone | 2 | 8 | 22 | 0.144 |
| Methotrexate | 5 | 14 | 27 | |

Leucocytosis was seen in 6 cases of polyarticular, 16 cases of systemic type which was statistically significant (p 0.02). Anemia was present in 3 cases of oligoarticular, 7 cases of polyarticular, 15 systemic type with no significance.

ESR was elevated in 2 cases of oligoarticular,11 cases of polyarticular, 24 cases of systemic type with statistical significance p 0.01.Rheumatoid factor was positive in 5 cases of polyarticular and systemic onset type each. It was negative in all cases of oligoarticular type . there is no statistical significance.ASO was positive in 2 cases of

oligoarticular ,3 cases of polyarticular, 7 cases of systemic type with no significance.CRP was positive in 4 cases of oligiarticular, 6 cases of plyarticular, 22 cases of systemic type with no statistical significance NSAIDS were used in all cases of oligo, poly and systemic type.Prednisolone was given in 2 cases of oligoarticular, 8 cases of polyarticular,22 cases of systemic onset type. P value was significant 0.031Methotrexate was given in 5 cases of oligoarticular, 14 cases of polyarticular, 27 cases of systemic type with no significance

## DISCUSSION

In our study, there were 54 patients in last 2 yrs. The commonest type of arthritis studied in our hospital was systemic onset followed by polyarticular. This is in contrast to previous studies done (16) (18) where oligoarticular was the commonest type.

The mean age of patients was 7.83 yrs. Most of the children were affected between 9 to 11 yrs. Though previous studies (2) state that there will be a peak period of onset , the age incidence in this study is not concurrent with that which may be because of smaller group of study. In this study males slightly outnumber females. Males 51.95, females 48.1%. this is concurrent with two Indian studies( 17) and (16). Male : female ratio were 6:2 in oligoarticular, 9:7 in polyarticular, 13:17 in systemic type. Fever and joint pain were the predominant symptoms in all cases studied which is in accordance with previous studies in India (16) (19) and abroad (2) (3).

Rash was typically encountered in systemic onset type which is comparable with previous studies(8). Hepatomegaly was also associated feature in systemic onset type. This is comparable with studies in india (16) Pericarditis and uveitis were not associated with any of the cases studied. This is in contrast to studies in India (16) (18) and abroad (2) (8). This could be due to smaller group in our study and poor representation of cases – only 8 cases of oligo articular type.

Among the joint involvement, knee and wrist were predominantly involved. Wrist, metacarpophalangeal, and metatarsophalangeal joints were characteristically involved in polyarticular and systemic type which was statistically significant. This is comparable with previous studies (19) . Articular involvement was found to be symmetrical in 6% cases and asymmetrical in 21%.

ESR was significantly elevated in majority of cases 77% it correlated with those who presented with disease activity and disability leucocytosis and CRP positivity was also a feature in those cases with significant correlation.

ASO was elevated in 22% cases which did not correlate. Rheumatoid factor was positive in 18.5 % cases – 9% in polyarticular, 9% in systemic type. These figures are similar with previous studies (2) (19). Rheumatoid factor positivity is said to be associated with occurrence of rheumatoid nodules. However in our study none of them had rheumatoid nodules.

Juvenile idiopathic arthritis being a chronic disease , anemia was present in 46% cases. NSAIDS was given in all cases as they all presented with joint pain initially. Steroids were started in 34 cases at start of study in view of disease activity. Methotrexate was given in 46 cases – 12 patient received subcutaneous methotrexate in view of disease activity and moderate to severe disability. At start of study, majority of children were having mild to moderate disability and disease activity- 5 cases 9% had severe disability. This worse disability was common in polyarticular and systemic

onset type which is comparable with earlier studies (20) where polyarticular had worst outcome. In contrast after 1 yr follow up in our study, none of them had severe disability and 12 cases of systemic type had moderate disability . 5 cases who had severe disability initially were started on subcutaneous methotrexate and prednisolone. At the end of 1 yr, 2 children had moderate disease activity and 3 cases had mild activity . so methotrexate and steroids are found to be effective in controlling disease activity. 2 out 3 children with polyarticular type who had moderate disability, improved after starting steroids and had mild disability after 1 yr. Out of 11 cases with systemic type who had moderate disability , after starting steroids 2 were free of disability and 3 had mild disability. Children < 8 yrs , 3 had severe disability ,in those > 8 yrs, 2 had severe disability. This is concurrent with previous study (22). Both male female had moderate to severe disability initially which is in contrast to previous studies (22)

## CONCLUSION

Juvenile idiopathic arthritis is the commonest rheumatological disorder of childhood. Although the exact incidence and prevalence figures are not available from our country , the condition has been reported from a number of centres in india. From these studies it is seen that the disease is somewhat different from that of west. Comparison with other studies is difficult so we need more samples and longer follow up. Disability status improves on treatment with steroids.

NSAIDS are the mainstay of treatment. Second line agents are the disease Modifying anti rheumatic drugs which are used when NSAIDS are not effective in controlling the disease. Methotrexate is the most frequently used drug.

Population based studies with stringent criteria and long term follow up are the best for studying the natural history and outcome but are tedious and time consuming . Even though hospital based study esp those from tertiary care centres cannot be true representatives of the outcome in a population yet they provide the first step in this regard

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